SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 07900 - Joint Sealers: Acoustical sealant.

B. Section 08310 - Access Doors and Panels: Access panels.

C. Section 16721 - Addressable Fire Detection & Alarm System: Fire alarm components in ceiling system.

D. Section 13930 - Wet-Pipe Sprinkler Systems With Fire Pump: Sprinkler heads in ceiling system.

1.03 REFERENCE STANDARDS

A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; **2000**.

B. ASTM C 636/C 636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; **2004**.

C. **ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2004**

D. ASTM E 580/E 580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2008a.

E. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components and acoustical units.

C. Samples: Submit two samples 4x4 inch in size minimum illustrating material and finish of acoustical units.

D. Maintenance Materials: Furnish the following for VCCS's use in maintenance of project.
1. See Section 01600 - Product Requirements, for additional provisions.
2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

A. **Inspection: Provide independent inspection and certification for compliance with ASTM C 635, ASTM C 636, and the manufacturer's installation instructions.**

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. USG: www.usg.com.

B. Acoustical Units - General: ASTM E 1264, Class A.
   1. **Maximum Flame Spread/Smoke Development Values per ASTM E84: 25/450.**

C. Acoustical Tile Type 1: Painted mineral fiber, ASTM E 1264 Type III, with to the following characteristics:
   1. Size: 12 x 12 inches (300 x 300 mm).
   2. Thickness: 5/8 inches.
   3. Light Reflectance: 83 percent, determined as specified in ASTM E 1264.
   4. NRC Range: 0.50, determined as specified in ASTM E 1264.
   5. Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM E 1264.
   6. Edge: Angled Tegular.
   7. Surface Color: White.
   8. Surface Pattern: Fine Texture.
   9. Basis of Design Product: Dune by Armstrong.
   10. Sag Resistant.
   11. Mold, Mildew, and bacteria resistant.
   12. Suspension System: Exposed grid Type 1.

D. Acoustical Panels Type 2: Painted mineral fiber, ASTM E 1264 Type III, with the following characteristics:
   1. Size: 24 x 24 inches.
   2. Thickness: 5/8 inches.
   3. Composition: Wet felted.
   4. NRC Range:.55, determined as specified in ASTM E 1264.
   5. Ceiling Attenuation Class (CAC): 33, determined as specified in ASTM E 1264.
   6. Edge: Square.
   7. Surface Color: Black.
   8. Surface Pattern: Perforated, small holes.
   9. Basis of Design Product: Fine Fissured by Armstrong.
   10. Suspension System: Exposed grid Type 2.

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:
   1. Same as for acoustical units.

B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.
   1. **Suspension systems shall be of adequate strength to support flexible sprinkler**

head mounting brackets.

C. Exposed Steel Suspension System Type 1: Formed steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.
   3. Finish: White painted.

D. Exposed Steel Suspension System Type 2: Formed steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.
   3. Finish: Black painted.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
   1. **Hanger wires to be minimum 12 gauge.**

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Touch-up Paint: Type and color to match acoustical and grid units.

2.04 CUSTOM PERIMETER TRIM

A. **Manufacturer: Same as for grid.**

B. **Components: Edge trim system for transitions between drywall and suspended ceilings. Extruded aluminum alloy trim channel, 10 foot straight or curved channel. Attachment to grid system is to be provided by specially designed tee-bar connection clips, which lock into specially designed bosses on theperimeter trim channel and are screw-attached to the web of the intersecting suspension system members. Sections of trim are to be joined together using splice plates.**
   1. **Curved Transition Channel for Tegular: 6 inch high curved channel to minimum inside and outside radii sections indicated on the drawings with special bosses formed for attachment to the tee-bar connection clip or hanging clip; commercial quality, extruded aluminum, factory-finished to match ceiling grid.**
   2. **Splice Plate: Galvanized steel finish; formed to fit into special bosses and locked in place with 4 factory-installed screws.**
   3. **Tee-Bar Connection Clip: Galvanized steel finished to match trim channel formed to fit into special bosses and locked in place by factory-installed screws and attached to suspension system members.**

2.05

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum

deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Miter corners.

K. **Hanger Wires:**
   1. **Suspension wires made of galvanized steel shall not be smaller than number 12 gauge and spaced no more than 4 feet on center along main runners unless calculations justifying the increased spacing are provided.**
   2. **The wire must be wrapped around itself a minimum of (3) full turns (360 degrees each) within a 3 inch length.**
   3. **Each vertical wire shall be attached to the ceiling suspension member and to the support above such that the wire loops shall be tightly wrapped and sharply bent to prevent any vertical movement or rotation of the member within the loops.**
   4. **Suspension wires shall not hang more than 1 in 6 out of plumb unless counter-sloping wires are provided.**
   5. **Wires shall not attach to or bend around interfering material or equipment.**
   6. **Main runners shall be attached and leveled to within 1/4 inch in 10 feet. Determine elevation of levelness from measurements taken below hanger points and after completion of the ceiling installations.**

L. **Main Runners and Cross Tees:**
   1. **All fire expansion relief cut-outs in the main runner shall be installed within 3 inches of a vertical support hanger wire.**

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION